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**PLEASE STAMP TO ACKNOWLEDGE RECEIPT OF THE FOLLOWING:**

In Re Application of: Burroughes et al.

Application No.: 09/508,367

Filed: March 10, 2000

For: ELECTROLUMINESCENT DEVICES

Parent Group Art Unit: 1774

Parent Examiner: Thompson, Camie S.

1. Information Disclosure Statement (3 pages)
2. PTO Form 1449 with references
3. Check for \$180.00

Dated January 1, 2004

Docket No.: 08513.7022-00000

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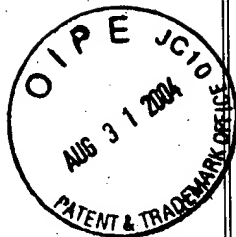


(Due Date: 1/30/04)

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PATENT  
Customer No. 22,852  
Attorney Docket No. 08513.7022-00000

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of: )  
)  
Burroughes et al. ) Parent Group Art Unit: 1774  
)  
Application No.: 09/508,367 ) Parent Examiner: Thompson, Camie S.  
)  
Filed: March 10, 2000 )  
)  
For: ELECTROLUMINESCENT )  
DEVICES )

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

**INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. § 1.97(c)**

Pursuant to 37 C.F.R. §§ 1.56 and 1.97(c), applicant brings to the attention of the Examiner the documents listed on the attached PTO 1449. This Information Disclosure Statement is being filed after the events recited in Section 1.97(b) but, to the undersigned's knowledge, before the mailing date of either a Final action, Quayle action, or a Notice of Allowance. Under the provisions of 37 C.F.R. § 1.97(c), this Information Disclosure Statement includes a certification as specified by Section 1.97(e).

Certification: The documents listed in this Information Disclosure Statement were first cited in a communication from the Japanese Patent Office dated September 30, 2003 (copy enclosed with English language translation), in a counterpart foreign

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application, and this Information Disclosure Statement is being filed more than three months after the mailing date of that communication and is accompanied by a fee of \$180.00 as specified by Section 1.17(p).

The following table correlates the references in the JP office action with English language abstracts, counterparts or complete translations, and identifies one reference previously made of record.

Ref. 1	<b>JP 04-212286</b> <b>(same as U.S. 5,281,489)</b>	<b>enclosed with English abstract</b> <b>enclosed</b>
Ref. 2	<b>JP 07-85972</b>	<b>enclosed with English abstract and</b> <b>English translation (machine)</b>
Ref. 3	<b>JP 08-319482</b> <b>(same as U.S. 5,756,224)</b>	<b>enclosed with English abstract</b> <b>enclosed</b>
Ref. 4	<b>JP 03-114197</b>	<b>enclosed with English abstract</b>
Ref. 5	<b>JP 04-357694</b>	<b>enclosed with English abstract</b>
Ref. 6	PCT WO96/20253	Filed with IDS of 10/9/03
Ref. 7	<b>JP 08-41452</b>	<b>enclosed with English abstract</b>
Ref. 8	<b>JP 04-334894</b>	<b>enclosed with English abstract</b>
Ref. 9	<b>JP 02-261889</b>	<b>enclosed with English abstract</b>
Ref. 10	<b>JP 03-230584</b>	<b>enclosed with English abstract</b>
Ref. 11	<b>JP 2000-252077</b>	<b>enclosed with English abstract and</b> <b>English translation (machine)</b>
Ref. 12	<b>U.S. Patent 5,886,464</b>	<b>enclosed</b>

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Applicant respectfully requests that the Examiner consider the listed documents and indicate that they were considered by making appropriate notations on the attached form.

This submission does not represent that a search has been made or that no better art exists and does not constitute an admission that each or all of the listed documents are material or constitute "prior art." If the Examiner applies any of the documents as prior art against any claims in the application and applicants determine that the cited documents do not constitute "prior art" under United States law, applicant reserves the right to present to the office the relevant facts and law regarding the appropriate status of such documents.

Applicant further reserves the right to take appropriate action to establish the patentability of the disclosed invention over the listed documents, should one or more of the documents be applied against the claims of the present application.

If there is any fee due in connection with the filing of this Statement, please charge the fee to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

Dated:

*Jan 9, 2004*

By:



Therese Hendricks  
Reg. No. 30,389

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**COPY**

(Abridged Translation)

Rejection of the Application

Dispatch Date  
September 30, 2003

Application Number: 2000-537271  
Date of the rejection: September 17, 2003  
Name of Examiner: Masako IMAZEKI 9529 2V00  
Attorney for Applicant: Yoshihiro CHIBA  
(with the other attorney)  
Applied Provisions: Sections 29(2) and 36

This application should be rejected for the reason below.  
If the applicant has any argument against the reason, such argument should be submitted within 3 months of the date on which this notification was dispatched.

Reasons:

<Reason 1>

The recitation in claims of the present application does not meet the requirement of Section 36(4) and 36(6)(ii) of the Japanese Patent Law as mentioned below.

Details:

A. Regarding the structure of a light-emissive layer, the Japanese terminology "a mixture" in claim 1 does not cover a layered structure of respective components or a structure having components which are chemically bonded. The term "phase-separated" is also unclear. It seems that the term "phase" does not mean the three-phase of the substance (solid, liquid and gas).

In the Argument submitted dated June 24, 2003, the applicant argued that in the light-emissive layer there may be varying concentrations of the three components in the light-emissive layer. In this sense, it is approvable that the layer comprises a mixture. However, in another sense, that is, the definitions of a mixture in the light-emissive layer are not generally approved, which are shown in the argument against the 4th reason of the rejection or the argument against the 17th reason of the rejection in the submitted Argument.

Accordingly, there is technological inconsistency among claims 2, 9-13, and so on. Dependent claims of these claims

are also inconsistent. For example, in claims 14 and 2, it does not make sense that three components are phase-separated while the light-emissive layer is formed by deposition of three components concurrently.

B. In claims 4 and 7, as to the phrase "the...component has a greater affinity", the applicant explained that affinity is defined as a physical force to draw or attract a substance. Regardless of the definition, it is unclear what kind of material has a greater "physical force to draw or attract a substance" than the second component has. Thus, the invention is not clearly understandable.

C. In claims 35 and 53, the definition of "a luminescent type II interface" is unclear. Though in the paragraph [0020] (\*Note: the paragraph from line 21 in page 7 of the English specification) it says: "type II interfaces which do not lead to charge separation", its technical meaning is unclear.

D. In claims 56 and 60, the step of "treating ... to influence the phase structure of the light-emissive layer" is too vague to define the scope of the invention clearly. It is not possible to clearly limit the scope of the invention, about a feature which is not described in the specification.

As the applicant argued in the argument against the 15th reason of the rejection, the specification recites one example. However, the recitation of claims 56 and 60 is too generic.

E. In claims 57 and 61, the phrase "the step for treating...to increase the concentration of the first component" is still too vague as a step of forming method. It is not possible to clearly limit the scope of the invention, about a feature which is not described in the specification.

F. In claim 36, there are recitations as to "a first organic light-emissive component for accepting and combining...negative charge carriers from the second light-emissive component to generate light" and "a second organic

light-emissive component for accepting and combining...positive charge carriers from the first light-emissive component to generate light". However, it is unclear what relationship between the first and second organic light-emissive components allows each component to give and receive the carriers, even if detailed explanation in the specification is considered. Thus, it is not possible to specify an electroluminescent device in claim 36.

As mentioned above, the invention regarding claims 2-61 is unclear.

G. Besides the meaning of the "mixture" mentioned in the above item A, it is still unclear how the invention in claims 2-61 is implemented.

H. None of specific compounds nor how to obtain them as the material in claims 11-12, 43 are described.

Therefore, the description in the specification is not clear and sufficient enough for a person skilled in the art to implement the invention in claims 2-61.

<Reason 2>

The inventions defined in the claims mentioned below of the present application could easily have been made, prior to the filing of the present application, by a person skilled in the art to which the inventions pertain, on the basis of inventions which were described in the following publications distributed in Japan or elsewhere, therefore, a patent shall not be granted for the inventions under the provision of Section 29(2) of the Japanese Patent Law.

Details:

Cited references:

Reference 1:

Japanese Laid-Open Patent Publication No. 4-212286

Reference 2:

Japanese Laid-Open Patent Publication No. 7-85972 - Same

Reference 3:  
Japanese Laid-Open Patent Publication No. 8-319482  
Reference 4:  
Japanese Laid-Open Patent Publication No. 3-114197  
Reference 5:  
Japanese Laid-Open Patent Publication No. 4-357694  
Reference 6:  
PCT International Publication WO96/20253  
Reference 7:  
Japanese Laid-Open Patent Publication No. 8-41452  
Reference 8:  
Japanese Laid-Open Patent Publication No. 4-334894  
Reference 9:  
Japanese Laid-Open Patent Publication No. 2-261889  
Reference 10:  
Japanese Laid-Open Patent Publication No. 3-230584  
Reference 11:  
Japanese Laid-Open Patent Publication No. 7-85972  
Reference 12:  
US Patent No. 5886464 (class 313/503)

CLAIMS 1-15, 17-37, 40-41, 44-55 AND 58-59:

The references 1-12 are cited. Claims 16 and 42 involve an inventive step.

The cited references (1-3) and 8, for example, disclose an electroluminescent device comprises a light-emissive layer located between an anode and a cathode, and the light-emissive layer comprises: a hole transport material (a first component for accepting positive charge carriers); an electron transport material (a second component for accepting negative charge carriers); and a light-emissive material (a third, organic light-emissive component for generating light as a result of combination of charge carriers from the first and second components). Thus, such electroluminescent device is deemed as well known art. Especially see the reference 2, paragraphs [0035]-[0058] and the first embodiment; and the reference 3, claim 5 (\*Note: Claim 5 of the reference 3 corresponds to Claim 5 of US Patent No. 5756224).

Also, at least one pair of the three materials form type II semiconductor interface. See the reference 1, paragraph [0064]; and the figures in the reference 2.

Claim 2:

If the term "phase-separated" means a structure having



some separate layers, a multi-layered electroluminescent device in which some functions are separated in each layer is well known. See the reference 3, claims 1-4.

Claim 3:

Forming a hole transport layer between the light emissive layer and the anode is disclosed in the reference 1, paragraph [0072] and the eleventh embodiment; and the fifth embodiment in the reference 2.

Further, as disclosed in the references 4 and 5, a mixture layer having a concentration gradient between adjacent layers is well known in the technical field of an electroluminescent device. Thus, it is easy for the person skilled in the art to make the concentration of the first component increase towards the first charge carrier injecting layer, by applying the known art in the references 4 and 5 to the known art in the references 1-3.

Claim 4:

It is well known for a skilled person that the higher the adhesiveness between an inserted layer and the light-emissive layer and between the inserted layer and the anode is, the more preferable it is. It is well known for a skilled person to choose a component having a greater affinity.

Claim 5:

The hole transport layer or electron blocking layer inserted between the light-emissive layer and the anode corresponds to a layer comprising the first component shown in the present claim 5.

Claims 6-8:

The electron transport layer or hole blocking layer between the light-emissive layer and the cathode corresponds to a layer shown in the present claims, for the same reason mentioned as to the claims 3-5.

Claims 9-13:

The invention in these claims would be easily made if a skilled person applied the materials for an organic electroluminescent device disclosed in the references 6 and 7 to several materials in the references 1-3. Also, the invention would be easily made if a skilled person applied the materials disclosed in the references 6 and 7 to a hole transport light-emissive material and an electron transport light-emissive material in the reference 8.

Claim 14:

The method of making a light emissive layer is disclosed in the reference 1, paragraph [0067].

Claim 15:

See the above item as to claim 2.

Claims 17-25:

It is a matter of design choice for a skilled person to decide an optical gap or specific compound of each component.

Claims 26-35:

The features recited in these claims are well known for a skilled person, considering the principle of light emission in an electroluminescent device or the like.

Claim 36:

The first organic dye and the second organic dye in the reference 9 are though to correspond to a first organic light-emissive component and a second organic light-emissive component in the present claim, respectively.

Since the reference 9 further discloses that both of the first and second light-emissive components emit light in a single layer, it is admitted that each light-emissive component would give or accept charge carriers.

Also, the embodiment of the reference 9 recites some components (first organic dye: anthracene, and second organic dye: perylene, tetracene, and pentacene). In view of these compounds, it is admitted that the light-emissive components

would form a type II semiconductor interface with each other. The energy level is a physical property unique to each compound. The relative relationships are shown in Fig. 3 of Japanese Laid-Open Patent Publication No. 2000-252077.

Claims 37, 40-41, 44:

The reference 10 discloses a light emissive layer of two-layer structure having a type II semiconductor interface.

Claims 38-39, 43:

Specific compounds are unclear.

Claims 44-52:

The features about an organic electroluminescent device recited in these claims are well known to a skilled person.

Claims 53-55:

In view of, especially the figures of, the references 10-12, it is admitted that a heterojunction formed between the organic charge transport layer and the organic light-emissive layer would be a luminescent type II heterojunction.

The reference 11 discloses an electron injection molecule, a hole injection molecule, and a light emission site, which would correspond to each of first to third components in claim 54. It is easy for a skilled person to deposit these three components concurrently. See the reference 11, paragraphs [0024]-[0030] for the description of the light emission site.

Claims 58-59:

See the above item as to claim 36.

Accordingly, the invention recited in claims 1-15, 17-37, 40-41, 44-55, and 58-59 is easily made by a skilled person in view of the cited references 1-11.

For the claim(s) other than the claim(s) specified in this notification of rejection, no reason(s) for rejection has been found so far. If any reason(s) for rejection is found

later, it will be notified.

## INFORMATION DISCLOSURE CITATION

**COPY**

Atty. Docket No. 08513.7022-00000	Appln. No. 09/508,367
Applicant Burroughes et al.	
Filing Date March 10, 2000	Group: 1774

## U.S. PATENT DOCUMENTS

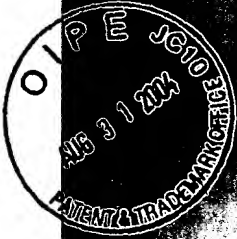
Examiner Initial*	Document Number	Issue Date	Name	Class	Sub Class	Filing Date If Appropriate
	5,281,489	1/25/94	Mori et al.	428	690	
	5,756,224	5/26/98	Borner et al.	428	690	
	5,886,464	3/23/99	Shi et al.	313	503	

Document Number	Publication Date	Country	Translation Yes or No
JP 04-212286	03.08.92	JP	English Abstract and U.S. 5,281,489
JP 07-85972	31.03.95	JP	English Abstract and English Translation
JP 08-319482	03.12.96	JP	English Abstract and U.S. 5,756,224
JP 03-114197	15.05.91	JP	English Abstract
JP 04-357694	13.02.96	JP	English Abstract
JP 08-41452	13.02.96	JP	English Abstract
JP 04-334894	20.11.92	JP	English Abstract
JP 02-261889	24.10.90	JP	English Abstract
JP 03-230584	14.01.91	JP	English Abstract
JP 2000-252077	14.09.00	JP	English Abstract and English Translation

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

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Examiner	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	
Form PTO 1449	Patent and Trademark Office - U.S. Department of Commerce



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**PLEASE STAMP TO ACKNOWLEDGE RECEIPT OF THE FOLLOWING:**

In Re Application of: Burroughes et al.

Application No.: 09/508,367

Group Art Unit: 2822

Filed: January 2, 1002

Examiner: Michael Manh Trinh /

For: ELECTROLUMINESCENT DEVICES

1. Transmittal letter
2. Information Disclosure Statement Under 37 C.F.R. § 1.97(c);
3. PTO Form 1449;
4. Copies of documents listed on PTO Form 1449; and
5. Check for \$180.00.



Dated 7/16/2004

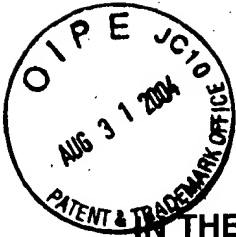
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(Due Date: NDD)

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PATENT  
Customer No. 22,852  
Attorney Docket No. 08513.7022-00000

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:

Burroughes et al.

Application No.: 09/508,367

Filed: January 2, 1002

For: ELECTROLUMINESCENT  
DEVICES

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) Parent Group Art Unit: 2822  
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) Parent Examiner: Michael Manh Trinh  
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Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

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A copy of the UK Search Report for GB 98 05476, on which this application claims priority, is attached. Of the four references noted therein, the last two are already of record (Applicant's IDS filed with the national stage application). Copies of the first two references are enclosed and listed on the Form PTO-1449.

Applicant respectfully requests that the Examiner consider the listed documents and indicate that they were considered by making appropriate notations on the attached form.

This submission does not represent that a search has been made or that no better art exists and does not constitute an admission that each or all of the listed documents are material or constitute "prior art." If the Examiner applies any of the documents as prior art against any claims in the application and applicant determines that the cited documents do not constitute "prior art" under United States law, applicant reserves the right to present to the office the relevant facts and law regarding the appropriate status of such documents.

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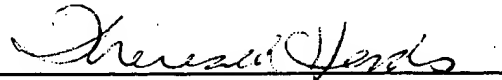
Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

Dated:

*July 16, 2004*

By:

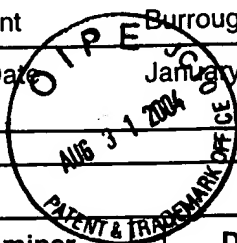


Therese Hendricks  
Reg. No. 30,389



## INFORMATION DISCLOSURE CITATION

Atty. Docket No. 08513.7022-00000	Appln. No. 09/508,367
Applicant Burroughes et al.	
Filing Date January 3, 2002	Group: 2822



COPY

U.S. PATENT DOCUMENTS						
Examiner Initial*	Document Number	Issue Date	Name	Class	Sub Class	Filing Date If Appropriate

Document Number	Publication Date	Country	Translation Yes or No
EP0774883A2	21.05.97	Europe	In English
EP0643118A1	15.03.95	Europe	In English

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)	
	Copy of Search Report from the UK Patent Office, dated 5 June 1998, in corresponding Application No.: GB 9805476.0

Examiner	Date Considered
<p>*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>	
Form PTO 1449	Patent and Trademark Office - U.S. Department of Commerce